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## ABSTRACT

This bibliography lists 78 documents in English and 7 in Swedish on the subject of open plan secondary schools. These documents are not annotated individually, but are discussed in a text that is divided into ten major subject areas: Theory, Buildings, Staffing, Scotland, England, International, U.S.A., Canada, Sweden, and Australia. Each of these areas is further divided into a number of subtopics. The 14-page text discusses findings relevant to each subtopic, referring by number to the appropriate bibliographic entries, and often citing page numbers where important concepts are discussed. Documents covering student attitudes, teacher attitudes, and the open plan school's impact on learning motivation are included among the citations. An introductory essay by Robert R. Reid touches on the characteristics of open plan secondary schools, particularly as found in Scotland, and discusses the nature of the educational processes such schools can accommodate. (PGD)

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# OPEN PLAN SECONDARY SCHOOLS

An Annotated Bibliography

C M MORRISON

U.S. DEPARTMENT OF HEALTH,  
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OPEN PLAN SECONDARY SCHOOLS :

An Annotated Bibliography

by

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with an Introduction by Robert R Reid

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## FOREWORD

by

Hugh Fairlie  
Chairman, SCRE.

It is a relatively easy matter to determine the amount of accommodation which is to be provided in a new school. It is not quite so simple to write a brief for the architect, for such a brief must indicate how the accommodation is to be used, the educational purposes which it is intended to fulfil, and the ends that are to be achieved. It is at this point that the educational planner incorporates his instructions as to the degree of "open planning" which the architect is to achieve, and how.

In doing so, he must know that to a considerable extent he will dictate the ends to be achieved by that school, for in a sense, buildings dictate policy, and means dictate ends. The policy and practice of those who use the resources is constrained by the nature of the resources provided. And at this stage in the history of educational development, who will confidently invest some millions of pounds in a new open plan secondary school without first of all discovering what evidence is available from such research and experiment as exists?

It is important that new school design should be based on the real experience of those who work in such open plan situations as already exist. Their successes, their failures to achieve the educational objectives implied by open plan design, where such can be attributed to the shape of the accommodation provided, must be explored. And for those who already work in open plan schools, or will find their future work in such, the considered experience of their colleagues will be most valuable. In this connection the introduction to this bibliography by Mr Reid is most welcome.

In spite of the cynics, the "open plan" system was not introduced to save space or money; it was introduced to provide opportunity for putting into practice some of the more recent ideas in education. Whether it does so, or whether, until a new generation of teachers is trained to accept such facilities and to use them to advantage, it is simply a case of old wine in new bottles, time alone will show.

Mr Morrison's bibliography will perhaps advance the clock a little faster.

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for School Building, Rotterdam.

CHARLES M MORRISON

# INTRODUCTION:

## A Personal Perspective

by

Robert R Reid

formerly Headmaster of Newbattle High School,  
the first secondary school in Scotland to have open plan accommodation,  
presently Headmaster of Musselburgh Grammar School.

"It is natural to begin with Scotland and easy because there is hardly any literature to review." Charles Morrison's words\* are a sad comment on the Scottish Education scene. Perhaps, like Topsy, open plan secondary schools "just grew". They have no known genesis, there is no obvious development. They exist apparently as an isolated phenomenon, an interesting digression from the mainline of educational architecture - a siding or, perhaps, merely a loopline. Certainly, attempts by the present writer to find a model in 1969 on being appointed to a Scottish Secondary School with open plan features proved of no avail. There were no precedents to follow in Scotland. As far as the Authority knew, there was no building in Scotland with similar or comparable features. There was nothing in England. Perhaps there was a building or two in the United States of America with open plan features, but Authority was not absolutely sure. There was no written material easily to hand on how to organize a school with open plan features. If there was any material to guide planners and architects, this was a well guarded secret. There was nothing available from at least one College of Education that could be of use in advising teachers. This same College did not even know that a school with open plan accommodation was being opened in its province - and over successive years stoutly resisted any attempt to learn about it.

Open plan is a delightful term, romantic rather than scientific. It is rather like the word "comprehensive". It means different things to different people. Within the secondary school "open plan" will vary in its connotation according to the subject area to which it is applied. But while the architectural details may vary, there are certain features, the absence of which - or the presence - qualifies an area for the description "open plan". The aim is the maximum availability of teaching space within the building. This can be obtained by obscuring the traditional distinction between "classroom" and "corridor". It can be obtained by removing the internal walls between classroom and classroom, freeing the teaching group from definition according to the accepted or preconceived notions of the amount of space required by an activity. Thus, instead of having two walled classrooms each designated as being adequate for thirty pupils, a school with open plan accommodation would devote the same amount of continuous floor-space to sixty pupils. But these sixty pupils can now be arranged into groups of a size that will vary according to what is being done at the moment. In a practical area more or less floor-space can be used according to the needs of the individual class-teacher. Flexibility

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\* See p7.

then is of the essence. This flexibility can be obtained with moveable room-dividers, or by a tacit recognition between groups of the amount of space needed for and devoted to whatever is happening in an area. "Open plan" accommodation therefore challenges the concept of one teacher in front of a group of a fixed size, teaching to the middle of the ability range. It requires new thinking about the approach to teaching.

The concept of the team emerges, making demands on personnel different from the conventional. To exploit open plan accommodation fully a group of teachers willing to work together, contributing to the thinking, planning, and execution of policy, and led by an able Principal Teacher, must be the norm. No longer can the Principal Teacher draw up a syllabus and withdraw to the seclusion of his own room and leave the members of his department to their own devices. No longer can the weak teacher shut himself in his own room, carefully screen the clear pane of glass, and scrupulously clean the blackboard after every lesson lest anyone discover his weaknesses. Everything now happens in the open. Weaknesses are exposed, but strengths can also be shared.

Departmental meetings are a feature of all schools these days. Much of the discussion of such meetings in conventional schools will be needed in open plan schools. These latter schools have further need of departmental meetings because of problems peculiar to themselves. Among these is planning, perhaps the most important. This is necessary to avoid duplication of teaching effort and also to avoid confounding of teacher effort. For example, a science lesson can be treated in three parts, exposition, practice, and summation. There is no real benefit in requiring one teacher to treat with only twenty pupils at each stage. With open plan it is possible to expound and demonstrate to more than twenty pupils at one time, but during practice it is no bad thing to have a ratio of one teacher to twenty pupils for safety's sake alone. Summing up and drawing conclusions from experiment again becomes a class activity - not necessarily to be restricted to twenty pupils per teacher. A group of sixty pupils can hear a lecture from one member of staff. Three members of staff can supervise the practical work and experimentation. Two members of staff can deal with groups drawing conclusions. Instead of three members of staff permanently tied to sixty pupils for the total time required, the demand on staff drops, freeing staff effort for other activities. Confounding of effort can arise, for example, in a technical department. Here the extractor fan needed when the forges or welding plant are in operation may make it difficult for an expository lesson in another part of the department to take place. Careful planning can obviate such occurrences and let both lessons take place at appropriate times.

Noise level is something that often worries the visitor to an open plan department. This is very much a matter for the particular department. Practical departments are places where noise is generated. This noise is rarely noise for noise sake but arises from the work being carried out. The total noise level has to be agreed among those operating in the accommodation. How much noise is needed before the individual teacher cannot teach has to be established - possibly by experiment - by each individual. How silently the operation can be carried out has also to be established. Good manners is the basis of a happy society. The good teacher will make no more noise than he has to make. His colleagues will tell him at the departmental meeting when he has made too much. The Principal Teacher will work towards securing harmony among his staff so that A's work, or B's voice, or C's machines will not disturb D's group, which in turn will not be allowed by D to distract the members of A, B, or C's group.

Distraction has been picked out as a ground for criticism of open plan teaching. The pupils in one group can be distracted by the activities of a neighbouring group. It cannot be denied that this can and does happen. But it does not necessarily follow that this is a criticism of the system. It can be rather a criticism of members of the system. If A's pupils are distracted by B's teaching, is B's method at fault? Is he too noisy? Is he too flamboyant? Is he, in other words, not showing the good manners needed in the department? This is something for discussion at the departmental meeting. On the other hand, is B's lesson much more exciting than A's, more stimulating, more interesting? Perhaps A needs some advice in the presentation of his lesson so that he can keep the attention of the class. But is all distraction a bad thing? Perhaps teachers as a class are too prone to think of themselves individually as the fount of all knowledge from whom and from whom alone the pupil can learn. Perhaps pupils can learn from the wider world of the department. Perhaps too what the class teacher feels is a distraction is something of which the pupil is not aware.

The maintenance of good order is dear to the heart of most teachers. The closed classroom, the strictly ordered rows of desks are so often the outward signs of this longing. Such an approach is not possible in open plan accommodation. The alternative approach must come from the team of teachers working together. The Principal Teacher is in the midst of his department setting the tone by example. He can be the model for the others. He has, of course, to be careful not to seek to lead his department by dominating it, but the standards he sets for discipline will be the standards to which his junior colleagues will aspire. The focal point in any teaching group is normally the teacher. The focal point is a practical group shifts as the teacher moves among his group. As a result there is a moving peripheral area where the pupil's attention is weakest and where he can be distracted from the work on hand most easily. In the conventional classroom this distraction can move easily into indiscipline. In the open plan area, however, the presence of a teacher in an adjacent group also moving among his group means that the peripheral area in one group can be near the focal point in the next. The teachers in open plan thus share, often without premeditation, the problem of indiscipline and curb it in a way not possible in the conventional school.

The pupil, it seems, could easily be lost in the open plan accommodation, surrounded by groups all busily pursuing knowledge, teachers before and behind to see that he applies himself. Activities of many kinds going on about him, the pupil must surely be fighting against all the odds. This need not be so and in fact is rarely so. Education in open plan departments is child-centred or it is nothing. The individual is important and his needs can be attended to in a way that the conventional class and its management do not allow. Open plan accommodation encourages the pupil's development in three different ways. The first of these is paradoxical in that although open plan is usually seen as a system for dealing with large numbers, it affords excellent opportunity for the teacher to meet the pupils in a one-to-one relationship. This, of course, stems from the fact that the teacher is not permanently positioned in the front of the group dealing with the group. Where a large number of pupils are active, there will be more than one teacher involved and he can take time to deal with the individual and his problems while his colleagues are engaged in similar plays. There is no need to hold back a whole class while one pupil is helped. This can mean that a large group can stream itself according to natural ability within a subject. Instead of an artificial grouping of pupils for all subjects, it is possible to take a large group of pupils within the subject and broad bands of ability can form themselves. An open plan area can accommodate and cater

for a group of "high-flyers", the main stream of achievers, and still give attention to less able pupils with a team of teachers far more efficiently than can the system of allocating a fixed number of pupils to one teacher. The flexibility of grouping with the subject and within the location work to the benefit of the pupil, a particularly desirable state of affairs in comprehensive schooling where classes are unstreamed. The fact that these groups will assert themselves even in different subjects, as long as there is a large enough area and team of teachers, makes pre-arranged streaming unnecessary and even undesirable.

The second stimulus applies mainly to younger pupils. It is not unknown to have different year groups at work in the one open area. Here is an excellent family situation where the young can learn from their elders. Seeing fifth year pupils at work in science laboratories can be an inducement to first or second year pupils, encouraging them to aspire to achievements in a way that the teacher cannot always match. While in turn it can induce in senior pupils a sense of responsibility which cannot fail to be of value to themselves.

The third contribution is the development of self-sufficiency that becomes apparent in pupils in an open plan department. There is very early seen among pupils being taught in open plan accommodation a readiness to get on with the job. Distraction and indiscipline have been mentioned earlier from the teacher's point of view. Pupils are given to curiosity. This curiosity is harnessed by the teacher. A visitor to a conventional classroom is a major interruption. The flow of the lesson is disturbed; the pupils are eager to know and to comment upon what is happening. They are not keen to continue with any work on hand while a visitor is in the room. The open plan department presents few such problems. Once the distinction between classroom and corridor is diminished, pupils become used to traffic passing through. Good manners among staff and pupils will limit the amount of this traffic, of course. What does happen will be merely a subject for momentary scrutiny by individuals - not by the class as a whole. The caller who has business with the teacher can choose his moment within the area without further distracting a class by peering through a glass pane in the door to see whether the moment is opportune. The visitor to an open plan area becomes very quickly part of the pupil's background in a way that is not easy in the classroom.

But it must not be thought that the pupils will always be in a crowd in a large space in an open plan area. There is a need for a withdrawal area somewhere in the department. This is not to say that every open plan area needs a parallel provision of classrooms, but there must be some place a teacher can take a group away from the larger group. This may be for detailed exposition, for advice to a limited group, for comment to the individual. It is not a retreat from the open area, rather a necessary adjunct.

Reference throughout this article has been principally to practical subjects. It is no part of the writer's brief to argue for open plan accommodation for one subject or type of subject as compared with another. Experiences has been drawn primarily from practical subjects, but experiment has been made in mathematics and history teaching. Both can be taught in open plan accommodation - as probably can any school subject. Several preliminaries have to be observed, however. The staff involved have to think that there is a possible value in the attempt. They must be prepared for it - it is not an excuse for being gimmicky. They must be flexible in their ideas - it is no use persisting in attempt which are not showing results, but neither must they run back to the bolt-hole of the classroom without giving the experiment a chance.

Teachers may be conservative. They may be insecure unless surrounded by four walls. Give a teacher an architect's drawing of an open plan school and he will reach for a pencil and ruler. Like children in the game, he will draw in the boxes that will be classrooms. Perhaps the Colleges have not given enough thought to students in training who might need to teach in such surroundings. Perhaps Authority needs to establish in-service courses to prepare staff for appointment to such schools. Perhaps research has neglected them. No one in Scotland can say that the open plan schools are producing better pupils than the conventional secondary schools. Looking at current building trends, one is tempted to ask, "Is it worth trying to find out?".

OPEN PLAN SECONDARY SCHOOLS:  
an Annotated Bibliography

1.1 Theory. Open Plan buildings are intended to permit both adaptability and flexibility. Adaptability looks to possible change in use, flexibility to varied use. Adaptability is to allow for changes in use that had not been thought of or foreseen at the time of building. Obviously this has limits. Though there are many types and degrees of Open Plan, the following seem to be the main varieties of use which it is intended to provide for: learning in groups of various and perhaps varying sizes; individualized learning; practical work undertaken at the appropriate moment, not at specified times; teamteaching which may be either specialization with a department, or interdepartmental (cross-departmental, integrated). In all of these the stress is on learning rather than on teaching, with less 'confrontation' (literally and metaphorically) of teacher and class.

1.2 Such uses are in line with the ideas of Open Education, which often underlie the outlook of advocates of Open Plan; but Open Education and Open Plan are not tied to each other. Open Plan schools may be run on community-based lines, (perhaps with expansion of the staff to include non-teachers), they may be run on democratic lines, they may be fitted out with sophisticated educational technology; but none of these is essential in an OP school. Indeed OP schools may in fact be run in a way that deliberately reduces their differences from 'closed plan' schools - for being schools they still have to be run (largely) by teachers, who may or may not conform to the underlying ideas of OP.

2.1 Buildings. Flexibility of use could be increased indefinitely by adding more and more rooms of different sizes and shapes and with differing equipment; but generally financial control has limited total cost or total space or both - the same space or the same money has been utilized in ways different from the traditional.

2.2 OP schools differ from one another much more than do traditional schools from one another. However, typical features are: fewer internal walls and more mobile partitions; no corridors; rooms (or enclosable spaces) of varying sizes, from very large halls to small seminar rooms; deliberate grouping of rooms (with staffroom, staff workroom, toilets, etc.) to provide a home centre for either a Year (usually first, or first and second) or a Subject (Faculty) or group of Subjects (usually in the upper years). Often there are Resource mini-Centres for each grouping, as well as a large central Resource Centre which of course is not a feature peculiar to OP schools.

3.1 Staffing. This is crucial. Staff opinions of OP schools depend largely on whether the individual likes or does not like the kinds of educational activity that OP facilitates. Consultation with staff beforehand and training seem to be strongly indicated. Increased use of non-teaching staff in close relation with teachers may be resented.

4.1 Scotland. It is natural to begin with Scotland and easy because there is hardly any literature to review. Fortunately there has very recently been made available an unpublished summary of a nationwide survey of OP secondary schools by school inspectors. Otherwise very little has been published. There is one article about a particular department in one school. In the absence of more relevant material, two references are listed referring to primary schools. There is as yet nothing that can be called research.

4.1.1 Scotland: Overview. The document by the inspectorate, (67) being itself a summary, deserves more space than can be given here. In general, its findings agree with the earlier ones from Australia and Sweden. There are however no wholly open-plan secondary schools in Scotland. The departments most frequently so planned are art, home economics, science, technical education and less often social subjects. The aims which the Education Authorities appeared to have in mind when deciding to build OP schools were:

- (1) facilitation of a wide range of learning activities;
- (2) better value for money through increased versatility and flexibility of use;
- (3) a stimulus to curriculum change;
- (4) a freer discipline;
- (5) readier access to expensive learning resources.

The types of layout in general use were either (a) wholly open areas for a subject department; or (b) wholly open areas for a Year group, usually First of Secondary Year; or (c) for a subject department open areas plus traditional class or practical rooms.

On building costs, the report notes that higher expenditure is needed to provide desirable standards of acoustics, heating, lighting and ventilation; but there are savings on partitioning. In staffing, more auxiliaries and technicians are required for full effectiveness, particularly in social subjects and science.

In general, there had been inadequate staff consultation, preparation, and training.

The majority of open areas were not effectively used (except for art) either because of defective design or because teachers used inappropriate methods. Good design must provide enclosed areas, either to contain noise or provide shelter from it.

There was little evidence of a stimulus to varied or co-operative teaching methods. Only one 'integrated' area was found to justify its title. Many teachers (but not pupils) were uneasy about different age groups being in the same area; but there was some evidence that it could work satisfactorily. It does however make heavier demands on organizing ability.

If furniture is moved about to suit varying needs, escape routes must be kept open.

The majority of the teachers expressed reasonable content, welcoming closer involvement with colleagues, contact with different teaching styles, and support for inexperienced teachers. Others did not like working in full view of colleagues. Pupils were apparently happy, especially in business studies and science, and adjusted quickly. Their behaviour, if anything, improved.

The main conclusion is that changes in building design may facilitate but cannot actually bring about any real change in teaching methods. Suggestions are made for research.

4.1.2 Scotland: Account of a Department (62). This article by a headmaster and a principal teacher tells how a technical OP department works satisfactorily. No single activity happens that could not happen in enclosed rooms: 'what is unique is the diversity offered in one area' - dance building, car mechanics, house painting, making stage scenery, plus traditional woodwork and metalwork. 'The relationship between pupils and teacher resembles that between apprentice and journeyman in the factory.' Noise could at times be a problem, and a small quiet area had to be constructed. It is pointed out that there is no saving in staff, rather a need for ancillary help.

4.1.3 Scotland: Lessons from Primary Schools. (36). Though this book is concerned with the lowest classes of a primary school, some of the conclusions reached are relevant for secondary schools. The author argues that a main motive of the change to open-plan schools is the provision of more tutorial contact between teacher and pupil. This requires that the other pupils in a class are able to occupy themselves in educational activities without immediate supervision, changing activities when appropriate. This in turn involves freedom of movement and easy access to a variety of materials, which are both facilitated by an OP layout. He shows that the proper utilisation of such freedom requires careful flexible planning and much preparation by the teacher.

(72). A brief survey of apparent advantages and disadvantages of OP primary classrooms, based on rational analysis, not research. Advantages listed are flexibility in accommodating number changes, ready sharing of resources, aptitude for team teaching, opportunity of learning from other teachers, lower costs. For success however teachers must be co-operative, there must be withdrawal areas, thoroughfare routes must be planned to keep down disturbance, and numbers must not be so great as to have a bad effect on emotional stability.

5.1 England. I have not come across any overview of the situation in England.

5.1.1 England: Building Plans. There are six relevant Building Bulletins of the DES (15 - 20), which tell of new buildings with OP features.

15 gives plans for Workshop Crafts. Accommodation has been planned with a minimum amount of walling to separate different aspects of Crafts. There are however problems of dust and grit, of high noise levels, and of supervision, 'fairly close guidance' being required in some of the work. The Bulletin recommends avoidance of 'isolated boxes which impose an inflexible pattern of work' but it is not enthusiastic about open space.

16 gives plans for Arts & Crafts. (See paras 14, 15, 39, 131-4, 152; and diagrams 37, 38). The Bulletin does not come down firmly on either side: 'opinions among teachers will always differ'. On behalf of open space it is claimed that more energy and richness are engendered when there are small groups in an open space. But multipurpose spaces demand more area for a given number of workers.

17 shows how existing buildings may be altered to make a Comprehensive School. The emphasis is on alternative uses - a dining area with sliding folding doors can be used during breaks for a common room plus a quiet room, at other times for assemblies, lectures, day-to-day drama, music, films, meetings.

18 describes a Sixth Form Centre designed to provide for large lecture groups and an increasing amount of private study. There are 9 tutorial rooms (for up to 4), 5 seminar rooms (for up to 20), a drama area, a lecture theatre (for 112) and two open suites; also three 'study areas', seating from 12 to 24. The Centre is designed for 276 pupils.

The most relevant is probably 19, Maiden Erleigh Secondary School, the most original 20, the Abraham Moss Centre. At Maiden Erleigh (see paras 16-20) the design should allow teachers to choose block grouping and flexible timetabling. Work might sometimes be organised for units of 80 to 120 pupils. But there could also be a range of group sizes: individuals, pairs, discussion groups of 8 to 20, film audiences of up to 60. What is called a 'centre for related studies' has a core of unspecialized spaces with variable-sized rooms on the perimeter, some closed and some with movable partitions. A 'general work space' can be divided with storage furniture units into subspaces for reference, written work, project display, individual study, or social areas. The Abraham Moss Centre exemplifies much the same general style, but is designed to provide for adult 'community' activities on the same site.

These Bulletins provide no critique of the designs, but the writers evidently are prepared for differences of opinion. 'Opinion among teachers will always differ as to how space should be arranged and equipped ... interests change as staff changes' (16, para 14); 'accommodation which too exactly entrenches any particular pattern may well restrict future options' (19, para 15); 'before a school is built, broad assumptions have to be made with which future teachers may or may not be in sympathy' (17, pp12-13).

5.1.2 England: Pupil Reactions. (5). 60 pupils entering an OP middle school were questioned regarding their opinions of the school during their second term there. 20 had come from a closed traditional primary, 20 from a closed progressive one, and 20 from an OP progressive. The sexes were in equal numbers in each group, and the groups matched on teacher ratings of IQ (sic), self-confidence, ability to communicate and general behaviour. 82% preferred that their next school be OP, but 80% were worried about the absence of doors in their middle schools. The chief objections were to noise and too much movement. The multi-purpose hall was the main cause of distraction. However, a majority said they found it easier to produce their best work.

5.1.3 England: Teacher Reaction. (76). Though this is a report on experience in OP primary schools, it is worth noting the conclusions that there must be withdrawal areas, work areas, and sound-insulated areas. OP schools have increased need for auxiliaries. Another conclusion is that the freer the method, the greater the need for structuring.

6.1 International: O.E.C.D. Pearson's booklet (58) is a guide based on a general study of OP experience and gives a balanced review. Change in educational theory and practice justifies less regularly cellular plans for schools (p5); but there have been extremes of monotony and of variety (p14). An undifferentiated open plan is not favoured - it simplifies the architect's

brief, economises running costs, and saves capital in meeting educational change; but the space required per pupil plus the quality of necessary environmental control make it too costly (p27). Separate specialist blocks tend to restrict across-the-board curriculum studies, which are aided by dispersal of some special facilities in general learning blocks, (p28). Flexibility is limited partly by dirt, noise, and fumes; partly by the need for quiet teaching; partly by the special needs of language, music, drama. It is noted that young people today are more tolerant of intrusion. Well designed mobile furniture and storage units are essential. Technical aids have aided flexibility: daylight projection, rechargeable power packs, simple recording facilities, transistorized TV monitors. A caution is added that escape routes must be considered when there is a maze of furniture 'dividers' and windows cannot be opened. In paras 71 to 79 references are made to teacher opposition.

6.2 International: O.E.C.D. This reprint (56) from the OECD Observer is a brief compendium of advice. There is a list of current ideas about needs for space in schools: to provide for small groups, for discussions and seminars, for independent study and investigation; for room for teams of teachers to discuss common projects and prepare teaching materials; and for accommodating with easy access new resources such as tapes, filmstrips, computer terminals. But when architects ask about number and sizes of space required, they do not get a clear answer, so they provide large areas of undivided space, hoping that teachers would create by partitions or furniture the spaces they desired. There is a need for teachers who can engaged in effective dialogue with architects. Standard schedules of accommodation are undesirable, but standard cost limits have proved useful in providing for innovation without waste. Well designed furniture can reduce area needs, and extended hours of use by the community can increase cost-effectiveness.

6.3 International: Council of Europe: This booklet (14) is not as useful as (58), though it adds some account of individual schools, such as that at Marly-le-roi (pp47-49).

6.4 International: UNESCO. Choudhury's paper (11) is a technical report possibly of use to architects.

7.1 USA: General. A survey of article titles in periodicals and of ERIC references suggests that USA has pioneered OP on a large scale; but most references when I have been able to check turn out to refer to elementary schools. In (26) there is a list of 11 High Schools which may be written to for further information; but I have found no general survey of how widespread innovation of this sort is. Fredrickson (28) thinks that High Schools have changed only slightly - flexible design cannot guarantee flexible use.

7.2 USA: Definition and Use. 'OP schools are composed of broad expanses of enclosed space unbroken by walls ... subdivided into smaller discrete areas by use of movable panels, screens, plants, or rolling casework'. (26,p32). As activities and group sizes shift, these spacedividers move with them to create new spatial relationships. OP allows for teamteaching, for programmed learning, and for individual instruction media. The pupils find more varied spaces, more teachers to relate to, older and younger classmates, accessible materials, a rich sensory landscape. But it can be overwhelming and confusing if not properly understood. (26, pp32-34).

7.3 USA: Underlying Ideas. These are expounded and advocated in (60) and (75), and reviewed rather unfavourably in (22). Propst (60) attacks the average school as dull and unpleasant (p14), where pupils often know little about their fellows and learn little about themselves (p13); educational warehouses where people are stored and maintained (p33), where the toilets tend to become intensively used as small-group social territories (p47). The basic goals ought to be cope-ability to live in an increasingly complex world, to contribute to the common good, and to find joy in one's own existence (p9). The best educational wisdom holds that people learn best through discovery and exploration, which means the elimination of grades, allowing work alone or in different-sized groups for variable amounts of time, with access to a great range of materials and equipment (p22). Propst's view is rather too rosy ("visible traffic becomes innocuous to learning activities if it is part of the natural life of the school" - p78); but he admits that without a sense of order or method, the school would take on a shanty-camp quality with teachers and pupils staking out turf and conducting continual brush wars over territory (p75).

7.3.1 Weinstock (76) stakes a more moderate claim, emphasising the desirability of replacing competition with co-operation (pp18, 22), and of socialization (p29): placing the learners well ahead of the learning. What qualities he asks make schools 'people-places'? - human scale, personal territory, spatial variations for 2s, 4s, 10, 20 or 100, manipulability so that spaces can be changed, optional seating and work surfaces (p50). Movement and change are by themselves goals for the young (p18).

7.3.2 Dreeben's chapter (22) is in a handbook of research (74), but is more a hostile dissection of arguments for OP. No one, he claims, has addressed the question of whether flexible use of space, and interesting tasks that children pursue at their own pace on their own motivation, have some connection other than sounding benign; of whether they become self-limiting under certain conditions; of whether the scheme works and under what conditions (p451). It is reasonable to ask whether pupils' conduct patterns vary with the arrangement of space (p464). Alternatives to self-contained classrooms are: small groups which are enormously demanding in preparation time, concentration, energy, and ingenuity; or additional teachers, but recent experiences suggest that team classrooms did not look much different; or open space for a variety of activities and tempos, but this does not solve low motivation except insofar as it is attributable to the small range of activities readily carried out in conventional classrooms. Gaining attention and establishing control remain potential problems (p467).

Apparently Dreeben was unable to find research evidence on which to base his chapter.

7.3.3. Christie (12) claims that OP can encourage individualized learning and more interdisciplinary programs, and can improve instruction because weaker teachers see stronger ones at work. The summary in ERIC does not indicate what evidence backs these claims.

7.4 USA: Use. BSIC (8) sent questionnaires to find how 10 of the High Schools built by School Construction Systems Development were actually used. It was found that teaching styles were not matched to the design: e.g. large open spaces were used 'disastrously' as self-contained classrooms. (Dreeben suspected this would happen - 22, p468.) Teachers' lack of knowledge prevented use of the potential. The main complaint was about noise.

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7.5 USA: Research. I have been able to find accounts of only a dozen or so pieces of research, and those mostly in ERIC summaries.

- (3) Arlin & Palm. Grades 1-8. 2000 pupils. OP pupils not more positive toward teachers, did not perceive they had more freedom, poorer attitude to mathematics and language.
- (6) Broward City. 6 schools in Florida, up to Grade 8. Tests of Basic Skills and Mental Maturity. Analyzed by sex, race, and ability. All significant differences favoured the conventional; but differences were most pronounced where the skills could be drilled.
- (7) Brunetti. High School pupils displayed self-direction and independence most strongly in an openspace environment. Reported in (13).
- (9) Burns. Science department only. Almost totally unfavourable. The author considered the problem of noise to be serious, and found there was more scientific activity in the laboratories than in the resource centre.
- (30) Gam. ky. Team teaching rather than OP as such. Grade 9. 74 pupils, with 71 controls. Subjects English and World History. The team-teaching pupils worked in large groups, small groups, in library and individually; controls worked by usual class methods. Little impact on achievement was noted. Team pupils were found to be more self-reliant, more interested, more positive toward teachers.
- (31) George. Most of the research reviewed deals with elementary and middle schools. Teachers in OP schools feel more satisfied, spend less time on routine activities. Teachers and pupils believe the noise level is a problem. Academic superiority is not demonstrated either way. OP schools seem to provide greater opportunities for 'alternative' learning goals, and facilitate the growth of more positive self-concepts. Great emphasis is laid on the need to prepare thoroughly for a change to OP.
- (39) Hoyle 1973. Four OP and four matched traditional High Schools in Ohio. 309 teachers filled in a Learning Climate Inventory and a Problem-Attack Behaviour Inventory (apparently regarding their Principals!). Out of 20 Learning Climate dimensions, the OP schools were found more 'open' on only 4. Not an impressive research.
- (40) Hoyle 1976. 30 schools, 700 classrooms, 867 teachers in Tulsa, Oklahoma City and Fort Worth, apparently at Junior Secondary level. Finding was that 'alternative teaching modes' do increase in OP classrooms.
- (42) Kyzar. Only 2 schools compared. No difference in the use of activities was observed between the OP and the traditional school.
- (43) Ledbetter. Inquiry in 4 Junior High and 2 High Schools into teacher and pupil reactions. OP liked in all, particularly by pupils. In the High Schools the noise was thought disruptive.
- (65) Schellenberg. Not clear if secondary schools involved. Emphasizes the need for special acoustical measures.
- (68) Sewell. Not clear whether secondary schools included, nor what is covered by 'Open Education'. Pupils approved of the learning environments, had higher self-concepts, no loss in academic achievement.
- 7.5.1 Very little of the above could be described as satisfactory research. Only (9), (42), (43) and probably (40) deal with secondary only, and the summaries do not permit disentanglement of the secondary in the others. (30) is secondary, but not clearly OP. Other possibly valuable sources which I did not obtain are listed in the References at (34), (64), (69), (70), and (71).

8.1 Canada: General. There has apparently been much development of OP schools, particularly in Ontario and British Columbia. Unfortunately I have not been able to see what may well be the most valuable sources: the Toronto Study of Educational Facilities (51) and Weiss (77). There are two useful bibliographies (50) and (10) from which most of the following has been culled. As with USA sources, it is frequently not possible to tell which studies involve secondary schools.

8.2 Canada: Research and other Summaries.

(35) Halton County. Included 75 Grade 8 pupils in OP, but they had no Grade 8 controls; so the findings of better pupil attitudes but also more time-wasting in OP may not apply to secondary. Inservice training is said to be essential.

(37) Hersom & MacKay. Edmonton. Satisfactory number of secondary - 14 Junior High Schools, but merely questionnaire to teachers. Opinion was deeply and evenly divided.

(44) Lee. Short account of one open Junior High School. Description of buildings and programme. Little attempt was made to evaluate.

(45) Lord Elgin High School, Burlington, Ontario. An interesting account of one OP High School. The evaluators were more interested in attitudes than in 'results', and they were not specially interested in the use of space. The report is favourable: traditional discipline problems almost eliminated - physical plan functioning well. The pupils see their work as fairly difficult yet are satisfied. An examination of open areas was promised for 1972-3, but no reply has been received to a letter of inquiry.

(51) Study of Educational Facilities. This would seem to be the most (or only) satisfactory study. About 100 secondary pupils (Grade 8) from 3 schools of each type (OP and traditional) were given tests of basic skills and a survey of study habits and attitudes; and there was some direct observation. All skill results favoured the traditional schools, all attitudes the OP; but nearly all the results were statistically insignificant. The writer thought that the OP philosophy was not fully implemented. This study might be worth obtaining.

Other references which might turn out to be relevant: (1), (2), (29), (52), (71), (73) and (77).

9.1 Sweden. There would appear to have been some thorough work done, especially in Malmö. Dr Bertil Gran very kindly sent 11 documents, but only 4 are in English, so I cannot report on the other 7.

9.1.1 Sweden: School Environments Projects, Malmö (66). This School Research Newsletter for May 1976 describes the Malmö study. The chief findings of the main study are reported in (33). Other publications reported on the design of remedial teaching in OP schools; on pupil attitudes; on analysis of interviews; on teacher attitudes after a year (they had changed very little); on flexibility of group size; on new patterns of teacher tasks (see 9.1.3 below). Then a comparative study was made of 6 OP and 6 traditional schools, involving 4500 pupils but mostly of elementary age, the oldest being 13. The study showed great difference among OP schools. Attitudes varied greatly. In Swedish and in Mathematics attainment in Grade 6, OP pupils of high ability did equally well with those in traditional schools, but others did slightly worse. OP schools valued partnership, openness and flexibility, gave more independent work and more team work. Another study of knowledge and skills found no lasting differences, but this seems to have been in elementary grades.

9.1.2 Sweden: OP Schools in Malmö Region - ed. Gran (33). This is an English translation of the summary and conclusions of the 1972 report on Malmö schools. Four days were spent in each of four schools, interviewing, observing, and giving questionnaires. There were no control schools, and the schools investigated had not been running long. Every school had a different layout. It proved impossible to relate attitude differences systematically to the way the rooms were being used.

Use of rooms. Schools used their rooms differently - some trying to achieve a high degree of openness, others of enclosure. In one school the study hall was used for diverse group activities, or for individual study by pupils from different levels at the same time; in another as 2 classrooms separated by furniture. The middle grades were often grouped by 'stations' - each pupils going in turn to different stations each with its own activity. Senior grades were grouped by class. Where there was an 'information' (lecture) room, there were often several classes attending together. The greater opportunities for varied grouping seemed to have been exploited. 'It is clear that both closed and open accommodation is required.'

Adaptability. The use of furnishings and partitions was generally being modified continuously, but with exceptions. There is need to study how far design directs activities, how far planning of activities directs the use. Design makes possible varying activities, but practical difficulties arise.

Circulation. There was a disturbing flow of pupils through certain rooms.

Grouping. Small groups are the favourites with both teachers and pupils, and even in small rooms pupils group their tables together. Different pupils prefer different ways of working; but unlike the teachers they do not like group activities in large spaces.

Noise. This proved a problem. Partitions made with furniture provided visual closure, but seldom modified disturbing noises.

General. Opinion on the whole was in favour of OP. Senior School teachers thought discipline poorer. (Is it relevant that most Senior School pupils thought teachers and pupils insufficiently acquainted?) They agreed however that social development was helped.

Although this was one of the most thorough 'inspections' I have read of, the team warns us that "the present data should be interpreted with extreme caution".

9.1.3 Sweden: New Patterns of Teacher Tasks (63). This is the only one of the numerous specialized reports of the Malmö OP investigations available in English. So much of the value of this report is in the detail that it is difficult to summarize. The need for OP schools arose out of curriculum development work by teachers who created new patterns of teaching. 'As a new organisation of teaching emerged, teachers found themselves hitting walls' (p11). On pp 7-8 is an account of the organisation required to set pupils to small-group work after a large-group lecture: 'suddenly one is surrounded by pupils - always pupils want to work with friends in another parallel class - many want to alter the tasks given, or to make their own'. It sounds realistic. Pp 11-12 give a description of work organized by 'stations'. (This type of lesson was filmed by the S.E.D. in 'Learning for Living' over 20 years ago.)

Teachers after one year reported great advantages and a revolution of habits (p22). But there was difficulty in keeping continuous contact with every pupil, a feeling of anonymity (p25). The three schools which tried to apply the new methods without prior experiment all went back to class periods of 40 minutes (p26). Extreme openness of design caused problems with pupils who had behavioural or ability disadvantages (p32).

The specific consequences of OP for teacher tasks are summarized on pp 26-27. For example: teachers had to co-operate and share responsibility; had to plan together, which was time-consuming; had to restructure subject divisions to make the matter more meaningful; required a broader subject knowledge; had to relate more individually and democratically to pupils. One result was 'depopulation of staffrooms'.

Rodhe and Gran (pp 47-48) see the teacher as having more of a management role - he needs more knowledge, more skills, changed attitudes. 'There may be real conflict of attitudes and values'. 'One can expect opposition', which as in Australia has in fact been provided by the teacher unions.

Educational researchers everywhere will sympathize with their rueful remark on p56: "Teachers, parents, and pupils are apt to expect clear and simple answers to hard and complex problems."

## 9.2 Sweden: Research Publications in Swedish (See end of list of References).

10 Australia. Help was received from the Education Departments of Western Australia, National Capital Development Commission, and South Australia, so that coverage here is satisfactory.

10.1 Theory. On the theoretical side are Beck's *Openness as a Variable in Educational Research* (4) and Hogben's article on Open Education (38). Beck discusses first what a research variable is, and whether openness can be a variable in educational research, Chapter V being titled 'A Term in Search of a Meaning'. Open Space is only one of the openness factors discussed by Beck; but the discussion though wide forms a useful background. I found it clear and helpful. He writes: "The tragedy is that so few teachers and so few writers even wonder whether there is a theory of learning behind what goes on in open classrooms, let alone try to put one into effect, that it would be farcical to evaluate their classroom in terms of testing a theory." (p44). In the end Beck seems to conclude that open space is not a necessary part of 'openness'.

Hogben's paper (38) distinguishes between Open Education and open space teaching. "The availability of an architecturally open classroom or unit is neither a necessary nor a sufficient condition for Open Education."

10.2 Australia: General Survey. McPherson's booklet (49) is a straightforward and useful account of the various Australian secondary school systems as at January 1975, and of the policy of each State on OP secondary schools. Every State has adopted, or is seriously considering the adoption of, some degree of OP. Queensland is the most conservative; South Australia, Western Australia and A.C.T. are all fairly radical. The favourite pattern of building is in blocks: class blocks for the lower grades (7, or 7 and 8) and subject (faculty) blocks for seniors. McPherson regards the general change to OP as a result of increasing emphasis on

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individualized learning, on co-operative teaching, and on interdisciplinary treatment of subject matter (p38). Classroom bases are seen as part of a total learning complex in which changes of spaces may be achieved by use of sliding screens, curtains, or movable furniture.

10.3 Australia: Plans. Plans of several recent High Schools are contained in (53), (54), and (30). The A.C.T. documents are in fact the detailed architectural briefs for Charnwood (53), Kambah and Melba (54) High Schools. The South Australia plans of Daws Road, Para Hills and Ingle Farm (30) are in one stapled document without descriptions but accompanied by a set of nine Progress Bulletins which kept teachers and others informed quarterly of the progress of plans and buildings.

Charnwood planners aimed at a flexible use of space by a careful planning of areas rather than by operable or sliding walls - 'freeflowing interlinked spaces with informal circulation routes'. In the general teaching/learning areas, spaces must provide for formal and informal arrangements of study groups under direct teacher supervision. Each learning complex has a number of enclosed classrooms and an open area equivalent to two classrooms opening directly to a suite area. The Science area provides space for a multiclass lecture, for small group discussions, for practical work, and for research with specialized equipment. Kambah and Melba do not differ enough from Charnwood to need a separate description. On circulation, it is said: "this should be as little separate as possible - within the academic faculties, circulation is through the open area, which when not in use for circulation becomes a free area" (App. C., p39). As all the South Australian schools are different, it would take too long to describe them. The general ideas are similar to those for the Capital Territory.

10.4 Australia: Evaluation. Though it was carried out before the schools had settled down (only three months) and while they were still only half or quarter full, Peterson's booklet (59) is the best evaluation I have come across. The author based his report on interviews and observations. Matters he thought relevant were timetabling and curriculum, usage of areas, working performance of areas, and storage. The architectural brief emphasized flexibility, but 'no amount of flexibility in a building can compensate for the inflexibility of a teacher' (p5). In Melba, forms (years) were not divided in the way designated in the brief. On open units, he gives the opinion that an unbroken undifferentiated open area inhibits 'growth-producing behaviour'. A large open area should at least suggest variety by colours, texture and lighting, so that pupils can identify with readily defined functional areas. In Kambah, the general staff opinion was 'Bring in the bricklayers' (p8). Open plan permits unpredictable behaviour patterns, and area requirements change accordingly; yet in Melba signs asked pupils not to move the furniture (p12). In the open areas circulation is a problem, and patterns have to be enforced. Pupils walk through the open area to reach withdrawal rooms; 'it is not to be expected in reality that pupils will walk the long way round' (p14 and fig. 2). Teachers and librarians want to (or have to) keep children in sight, so it is preferable to have areas where pupils are in sight (pp9, 15, and 17). Noise level was high despite acoustic treatment. "Problems of organizing such schools are immense. In USA it was soon learned that an informal atmosphere in school evolved because of sophisticated and unobtrusive organisation" (p6).

10.5 The South Australian Experience. There are four documents available concerned with the introduction of OP schools to South Australia: the plans mentioned above in 10.3 (23), 'Recent Trends' of 1974 (46), Teachers Study of 1975 (47) and 'The Senior Student' of 1976 (25).

10.5.1 'Recent Trends' (46) was written to help the new OP schools to develop, through provoking teachers to think about the principles they meant to apply and to analyze their practice critically. The first half of the booklet explains what needs to be evaluated, and how to set about it: clear and helpful but not directly relevant to the present survey. The author had been attached as a supernumerary to the first two OP schools, Para Vista and Para Hills, during their first year when they were less than half full. He observed, interviewed and discussed.

Pages 65-70 describe what he observed happening. Children came and went, talked a lot to each other, grouped and regrouped of their own accord or worked by themselves. It was a little noisy and distracting, but relaxed and friendly. They greatly valued the sense of freedom they had - noise and distraction was a price well worth paying. Pupils who liked quiet corners generally found them. Among the comments children made were: 'much independency' - 'seem more freer' - 'you can get to different teachers' - 'teachers interrupt your work sometimes'.

Much decision-making was devolved to teacher teams, which became cohesive and effective. Teachers found the working hours heavy - from 60 to 65 was quite usual - but not wanted to change back to traditional style. Formal teaching was almost eliminated and excursions were frequent. Pupils had 'unscheduled' time, the use of which was to be recorded by them; but when the recording cards were checked, a quarter of the pupils could not produce theirs, and at least a third merely followed what a friend decided on (which should surprise nobody). Though much work was individualized, there was no attempt to match the work to the pupil, and children were allowed to make their decisions too casually.

Lovegrove concludes that in general the building design had lived up to general expectation in facilitating more flexible approaches. Among the adverse criticisms he makes of the running of the schools are of the lack of analysis of the empirical evidence that had become available of success and failure; and of lack of involvement of the pupils with the content of the curriculum.

10.5.2 The Teachers Study (47) concerns the teachers who chose to enter OP schools; what attracted them to apply, and how they differed from teachers transferring the same year to traditional schools. Only about 60% of the intended sample were covered. From those who did reply, it appeared that these teachers were attracted by hope of better relationships (both teacher/teacher and teacher/pupil), of better teaching facilities, of more innovation. They were rather less conservative educationally than teachers transferring to traditional schools. After 29 weeks in the schools, 80-90% thought their expectations had been fulfilled.

10.5.3 The Senior Student in the Flexible Plan School (25). Despite the title, there is not much about the senior pupils themselves - the subtitle 'The Turning Point' gives a better idea of the content. The conference of which it is the report was really a review of the experience of OP schools once they had grown a top of senior students. The main part of the booklet consists of a set of reviews of the experience of each of the six participating schools as they grew each year, followed by a summary of discussion group findings on 'The Educational Programme' and on 'Staffing'.

It is clear that each of the schools had gone its own way, as it had been encourage to do by the Director-General. (See his 1970 Memorandum to heads, pp109-110 of (46)). They varied in organisation in all sorts of ways, though all had felt the need to subdivide into mini-schools; they varied in curriculum outside the standard subjects, in methods of

teaching, in degree of staff involvement, in degree of pupil freedom, in degree of community involvement (nowhere radical), but in all these respects they were 'innovative'. It is therefore impossible to summarize adequately their varying developments. I shall first mention some idiosyncrasies, then some general trends. Para Hills and Para Vista have already been mentioned in 105.1. The account on pp13-23 by J P McManus of the Para Hills experience is notably vivid. Banksia Park (pp42-45) had scheduled only 13 out of 25 teaching sessions. Pupils who found themselves confused by choice available, or had abused their freedom to choose, were fully scheduled. (This recalls Dalton Plan experience 50 years ago). A few pupils, about 60, had complete freedom outside the scheduled periods. Each pupil had a log card, surprisingly well kept. Morialta (pp53-57) offered four 'Modes of Learning':

- (i) co-operative: the amount of quality of the work was the joint responsibility of pupil and teacher - this was the majority way;
- (ii) structured: shorter-term goals and more teacher direction;
- (iii) autonomous pupils freed from many normal routine steps, encouraged to explore subject areas more widely and deeply;
- (iv) alternative: for the apathetic and rebellious - sometimes released from a regular timetable to work in a less formal way.

Size of School. All found that freedoms and shared responsibility became far more difficult as size increased. 'Anonymity' is repeatedly mentioned. It is difficult to tell whether the other general changes would have taken place without this increase in numbers.

Individualization of Work. This decreased as time went on; partly because accompanying 'cards' and assignments turned out to be as authoritarian as class teaching, partly because the demand on teacher time was overwhelming, partly because teachers 'spent more time interacting with pieces of paper and cardboard than with pupils' (13, p99). Teacher production of material should be rationalized and use of commercial material considered. 'Teaching became a respectable word again' (25, p15). Ingle Farm, having cut out individualization altogether, was going to bring it back in 1977 for senior classes (p51).

Unscheduled Time for Pupils. There is clearly a serious division of opinion on this. In 1973, one head confessed, 'We believed all 13 and 14 year olds appreciated sweetness and light and were never wrong'. But in 1976 the conference recommended (p75) that in the junior school it be left to the discretion of subject teachers whether to give any unscheduled time or not. It seems that in some schools at least pupils taking a foreign language have little or no spare time anyway.

Vertical Integration, originally much used, is under question. It is mostly used in Guidance groups.

Decision-making by the whole staff becomes increasingly difficult as numbers increase. The majority of staff want it, but meetings take up much time. Serious tension can be generated where opinions differ on a key policy, e.g. unscheduled time in Banksia Park (p41).

Team Teaching. As the school grew in size, teams knew each other less well, and change of staffing upset stability. The original staff were highly self-selected, and newer staff seemed to feel less committed, and thought the foundation staff had been overambitious.

Results. Perhaps the most sinister quotation in the whole report is 'The credibility of the school hangs on exam results' (p87). There was

at the same time however agreement that the nonacademic pupils were not catered for. But that is not peculiar either to South Australia or to Flexible Plan schools.

10.6 Australia: Other Sources. Further references to which I had not access may prove useful: (24), (32), (61) and (78).

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